

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : NISHIO et al.
PCT No. : PCT/JP2004/017255
Confirm. No. : N/A
Filed : May 18, 2006
For : VACUUM SUCTION HEAD...
Art Unit : N/A
Examiner : N/A
Dated : May 18, 2006

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

The following references have been cited in the International Phase of the above-identified application.

- JP 4-13590 has been cited under Category Y as being relevant to International claims

1 - 10. Fig. 1(a), and (b) show a vertical sectional view of a floating suck mechanism of the present embodiment, and Fig. 1(a) shows a state that a disk is sucked, and Fig. (b) shows a state that the disk is mounted on a spindle. In Fig. (a), a suck mechanism 7 is fixed on the tip of a robot arm 3 of the detecting device. A housing 7a, outer peripheral of the suck mechanism 7, is fixed on the robot arm 3. A stopper 7b is provided in an inner surface of the housing 7a, and the tip 7c is tapered to inward side. A press disk 7d is provided between the arm 3 and the stopper 7b in the housing 7a, and a spring 7e elastically connects the two so that the press disk can float horizontally. A guide disk 7g is connected to the press disk 7d elastically by the spring 7f and a guiding rod 7b is fixed to the guide disk 7g. A corn shaped concave part 7h'

corresponding to the taper 6b of the spindle is provided at the tip of the guide 7d. In the press disk 7d, a purity of metal pipes 7i are fixed on the circumference as shown in the figure, and suck parts 7i' are fixed on every tips thereof. Metal pipes 7f are penetrated into the guide disk 7g, so that the guide disk 7g is movable back and forth flexibly. An auxiliary guide plate 7j is provided to stabilize the guiding. Air is introduced via the suck part 7i' and exhausted through the exhaust duct shown by a dotted line through the metal pipe 7i and the press disk 7d, thereby a disk is sucked.

Next, in Fig. 1(b), when the suck mechanism 7 is lowered by the robot arm 3 and the tip of the guide rod 7b touches to the taper 6b of the spindle, the concave part 7h' is shifted and inserted into the taper 6b through the floating of the guide rod 7h.

In this case, the floating of the guide rod 7h is performed by a spring 7e, hence the spring 7e is declined as shown in the drawing and the press disk 7d and the guide rod 7h shift to the left side as far as the metal pipe 7i touches to the tip 7c of the housing. The slope of the tip 7c makes the floating of the guide disk 7g smooth. The spring functions so that the concave 7b' of the guide rod touches softly and the insertion smoothly. No translation is available at this time.

- JP 49-101974 has been cited under Category Y as being relevant to International claims 1 - 10. Fig. 2 shows an embodiment of the present invention. In the present embodiment, a spring mechanism connecting a base 2 and a swing part 4 is divided to two stage structure, namely spring 3-a and spring 3-b via the swing part 4. The mass of the movable part including the swing part 4, the object holding mechanism 5 and other object, not shown are supported by the spring structure. Under such conditions, assuming that the position of Z-axis

direction of the swing part 4 is a base position, the displacement from the base position is approximately proportional to the reactive force to the object from the Z-axis direction, thereby the binding condition to the insert direction can be detected irrespective of the mass of the movable part. No translation is available at this time.

- JP 34-2757 has been cited under Category Y as being relevant to International claim 3. Fig. 1 shows a sectional view of a supporting base, Fig. 2 is a plane view of a volute spring which is used with the supporting base of the present invention, Fig. 3A is a longitudinal sectional view thereof, and 3B shows a sectional view of the spring with round shape of its end. Fig. 4 is an extended view of the volute spring, Fig. 5 is a plane view of the bottom curved line of the spring, and Fig. 6 is a front view of the curved line. Fig. 7 is a front view of a conventional supporting base, in which a nut is disposed outside, Fig. 8 a front view of a conventional supporting base in which a nut is disposed inside, and Fig. 9 shows an apparatus which is fixed a spring using the supporting base of the present invention. No translation is available at this time.

Consideration of the above references is requested.

Respectfully submitted
for Applicant,



By: _____
John James McGlew
Registration No. 31,903
McGLEW AND TUTTLE, P.C.

Enclosed: PTO/SB/08a Form
copy of International Search Report
copies of (3) References

DATED: May 18, 2006
SCARBOROUGH STATION
SCARBOROUGH, NEW YORK 10510-0827
(914) 941-5600

SHOULD ANY OTHER FEE BE REQUIRED, THE PATENT AND TRADEMARK OFFICE
IS HEREBY REQUESTED TO CHARGE SUCH FEE TO OUR DEPOSIT ACCOUNT 13-
0410.